

June 29, 1979
Revised, February 18, 1999

Utah Department of Environmental Quality
Division of Drinking Water

RECOMMENDED PROCEDURES FOR HAULING
DRINKING WATER

Introduction

The purpose of this publication is to provide information on methods of hauling drinking water such that the health of the water consumer will not be threatened. Hauling is not a generally acceptable method of water distribution, but is sometimes necessary in emergencies and other unusual circumstances. Consult the local health department about local restrictions on water hauling.

The local health department and the county building department must approve any plans to haul water on a permanent basis. If the system serves more than 24 people at least 60 days of the year, the system is “Public”, and is regulated by state laws. Plans to haul water to “Public” systems must be approved by the Division of Drinking Water. The Division may approve these plans, but only if:

- (a) consumers could not otherwise be supplied with good quality drinking water, or
- (b) the nature of the development, or ground conditions, are such that the placement of a pipe distribution system is not justified, and.
- (c) the system does not operate more than 6 months of the year.

Source

Draw water from a source which is rated “Approved” by the Division of Drinking Water. If there is an extreme emergency and an approved source is not available, add sufficient chlorine to the water to achieve a 10 parts per million (ppm) concentration (see instructions for **chlorination** in Table 1.).

Equipment

1. The water contact surfaces (tanks walls/coatings, gaskets, hoses, fittings, and pumps) should not impart toxic substances to the water. The National Sanitation Foundation has standards for materials contacting water and aqueous foods.
2. The equipment must not have been previously used to transport items other than **potable** water or items for human consumption.
3. Tanks must be constructed to permit complete draining.
4. The tank vent should face down and a No.14 mesh or finer stainless steel screen should cover the vent.
5. The hauling equipment should be designed to minimize the entry of foreign material during loading, unloading, and transport. Caps and keeper chains should be provided for all outlets, and hose ends. Tank access ports should prevent contamination and be kept locked when not open.
6. Maintain adequate air gap between the end of the loading hose and the overflow of the water tank to protect the water source from contamination. This air gap must be at least 3 times the inside diameter of the loading hose. If the opening of the loading hose is not close to a wall (nearest edge of opening farther than four times hose diameter) the air gap can be reduced to 2 times the inside diameter of the loading hose. A suggested means of maintaining the air gap is shown in figure 1.
7. Any pump must be permanently connected to the tank and lubricated with mineral oil

vegetable oil, meeting FDA or NSF standards for human consumption and pump manufacturer's specifications.

8. To prepare for any emergency situation, local water officials should develop contingency plans for acquisition and use of approved water hauling vehicles. Milk haulers, fire departments, street maintenance departments, construction companies, the National Guard, and farms are potential sources of water hauling equipment.

Clean and Disinfect Equipment

1. The first time the equipment is used for hauling water, after extended periods of disuse, and periodically thereafter, thoroughly clean all accessible water contact surfaces. Scrub, brush, or steam clean as appropriate. Detergents may be used, but no solvents or toxic cleaners are permitted. After cleaning, the equipment should be thoroughly flushed and drained.
2. Disinfect all water contact surfaces by one of the following methods:
 - a. Swabbing or spraying. Prepare 200 ppm chlorine solution per instructions in Table 1. Swab or spray all water contact surfaces with solution. Reapply solution as necessary to keep surfaces wet for 30 minutes minimum.
 - b. Chlorination of full tank. Add enough chlorine to tank to achieve a concentration of at least 50 ppm when the tank and accessories are filled with water. Instructions for preparing chlorine solutions are shown in Table 1. Fill tank and accessories with water. Let solution stand for at least 24 hours. If enough chlorine is added for a 200 ppm solution, let solution stand for at least 30 minutes.
3. After disinfection, drain chlorine solution and thoroughly rinse equipment.
4. Keep system clean and avoid contamination during operation. Protect inlets, outlets, and hose ends by capping when not in use. Avoid contamination when loading and distributing water. Hose ends shall not contact the ground.

Load and Disinfect Water

1. Avoid contaminating water source. Maintain air gap as discussed in Equipment step 6. Protect water in air gap when conditions are windy or dusty.
2. Close the discharge and add enough chlorine to make a 1 ppm solution when the water tank is filled. See instructions for making chlorine solutions in Table 1.
3. Fill the tank with water.
4. Measure residual chlorine when unloading. If residual free chlorine is less than 1 ppm, repeat Step 1.
5. If unable to test free chlorine residual, double the chlorine called for in Step 1.
6. If there is an extreme emergency and an approved source is unavailable, add enough chlorine to make a 10 ppm solution.

Distribute Water

1. Avoid contaminating water hauling equipment when transporting and making deliveries. Keep discharge and loading connections clean and protected.
2. Individual water storage and distribution systems are subject to contamination. After hauled water is introduced, the water should be allowed to stand for a time to disinfect water which has remained in the system. It would be well for individual systems to take occasional water samples for bacteriologic analysis, particularly after extended periods of disuse.

Table 1. Chlorinating with 5 % Sodium Hypochlorite (Household Bleach)

ppm chlorine	Volume of 5% Sodium Hypochlorite Solution			
	1	10	50	200
Gallons Treated				
15	1/4 teaspoon	2.25 teaspoons	1/4 cup	1 cup
30	1/2 teaspoon	4.5 teaspoons	1/2 cup	2 cups
62	1 teaspoon	3 tablespoons	1 cup	4 cups
125	2 teaspoons	6 tablespoons	2 cups	1/2 gallon
250	1.25 tablespoons	3/4 cup	4 cups	1 gallon
500	2.5 tablespoons	1.66 cups	1/2 gallon	2 gallons
1000	1/3 cup	3.25 cups	1 gallon	4 gallons
1500	1/2 cup	4.75 cups	1.5 gallons	6 gallons
5000	1.5 cups	1 gallon	5 gallons	20 gallons

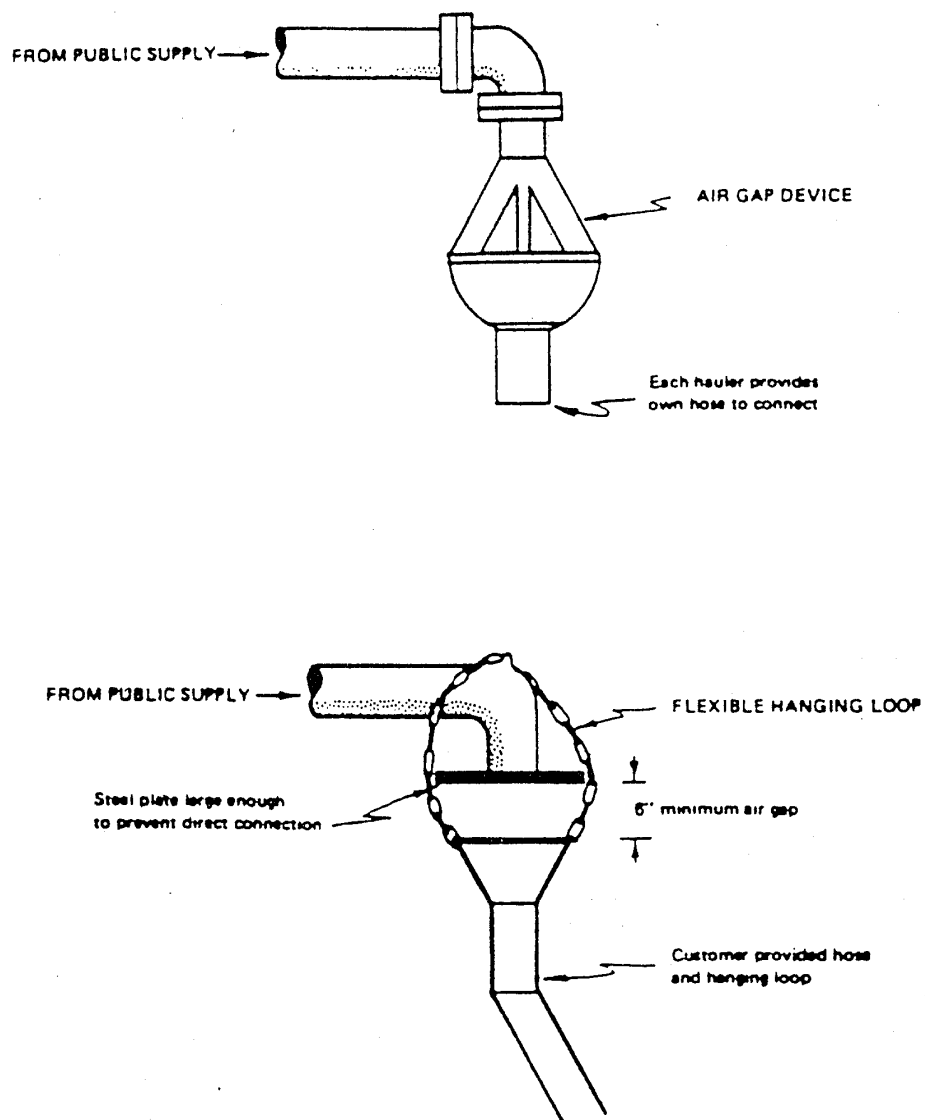


FIGURE 1.

Figure 1. Suggested Methods of Providing Air Gap.
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